FY12 PERFORMANCE PLAN

FIRE CHIEF
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JULY 1, 2011
TO JUNE 30, 2012

MCFRS AT A GLANCE

What MCFRS Does and for Whom	How Much
Mission **The Mission of the Montgomery County Fire and Rescue Service is to protect lives, property, and the environment with comprehensive risk reduction programs; and safe, efficient, and effective emergency response provided by skilled, motivated, and compassionate service providers representing Montgomery County's diverse population.**	**FY11 Statistics** • **Operating Budget: $183 million** • **Work Years (WYs): 1235** • **1110 County-employed emergency positions** • **883 volunteer emergency personnel (FFII and above or EMS Provider I and above)** • **135 County-employed technical and administrative positions** • **49 work sites, including 36 stations** • **34 engines (24 AFRA engines), 25 ambulances, 17 medic units, 15 aerial units (1 AFRA aerial tower), 7 heavy rescue squads, 7 tankers**
Emergency Response • **Response to structure fires to save lives and property** • **Response to ALS incidents to save lives in life-threatening medical emergencies** • **Response to BLS incidents to triage, treat and transport sick/injured persons** • **Response to other all-hazard incidents**	**FY11 Statistics** • **Budget: $123 million; WYs: 999** • **109,153 incidents:** **- 79,239 EMS incidents** **- 29,914 fire, hazmat, rescue, and other incidents** • **197,216 unit responses**
9-1-1 Call-processing and Dispatch **MCFRS personnel at the Emergency Communications Center take/process calls for assistance and dispatch MCFRS resources. They also provide pre-arrival instructions to the 9-1-1 caller as needed.**	**FY11 Statistics** • **Budget: $6.4 million; WYs: 53** • **Emergency calls processed: 137,095** • **Non-emergency calls– incoming/outgoing: 175,179** • **Total calls: 312,274**
Fire Marshal's Office **Fire Code Compliance (FCC) personnel inspect buildings for life safety violations, conduct system tests, and review building plans for fire code compliance. Personnel provide guidance to building owners on correction of violations and conduct re-inspections to ensure code compliance.** **Fire and Explosive Investigations (FEI) personnel perform investigations of major fires, potential arsons, fires involving injuries or deaths, and incidents involving actual or potential destructive devices.**	**FY11 Statistics** • **FCC Budget: $4.9 million; WYs: 34** • **Inspections: 13,139** • **Operational Permits Issued:** **20,516 renewals** **3,075 new** **23,591 total** • **FEI Budget: $1.9 million; WYs: 12** • **FEI Investigations:** **- Fire: 349** **- Explosive: 379**

Training of Firefighter-Rescuers	**FY11 Statistics**
MCFRS firefighter-rescuers receive required training at the Fire-Rescue Training Academy, through drills at stations and in the field, and via on-line courses to achieve certifications in fire, rescue, EMS, hazmat, and command competencies. Potential recruits are mentored via the Candidate Physical Ability Training (CPAT) program to develop their physical abilities demanded by the job.	• **Budget: $2.2 million, WYs: 15** • **177 classes taught** • **2260 students attending** • **183,965 student hours (averaging 81 hrs/student)**
Public Information and Fire Safety & Injury Reduction Education **The Public Information Office provides incident, safety, and other departmental information to the public via the broadcast and print media and via social media.** **MCFRS provides fire safety and injury prevention education, child safety seat inspections, and other risk reduction programs. Emphasis is placed on children, seniors, immigrants, health care facility operators, and residents of high-rise buildings.**	**FY11 Statistics** • **Budget: $353,781; WYs: 3** • **14,600 media calls handled by PIO** • **75 news advisories and releases** • **1.35 million Facebook post views** • **27,527 blogspot visits** • **2859 residences visited, with 122 smoke alarms and 97 batteries installed, through the Safety In Our Neighborhood program** • **5958 child safety seats inspected** • **56 Safe Kids outreach events held with 1537 participants** • **77 public and private schools participated in Risk Watch program**
Firefighter-Rescuer Wellness and Safety **The Fire-Rescue Occupational Medical Section (FROMS) provides annual physicals for uniformed personnel, coordinates medical care for injured MCFRS personnel, and provides wellness services to keep MCFRS personnel healthy and return those who have been injured to active service. Safety Officers inspect equipment and facilities and oversee personnel safety at major incidents.**	**FY11 Statistics** • **Budget: $15.1 million, WYs: 10** • **2115 annual physicals conducted** • **3 "life saves"of FRS personnel by FROMS [49cumulative since FY04]** • **350 personal protective gear inspections by Safety Office** • **20 work site inspections** • **3% decrease in workman's compensation claims**
Fleet Management **The Fleet Section implements the *Apparatus Management Plan*. Apparatus and equipment purchase, inspection, testing, and maintenance is overseen by this Section with the exception of that handled directly by LFRDs. The Central Maintenance Facility is operated by the Fleet Section.**	**FY11 Statistics** • **Budget: $6.4 million; WYs: 18** • **Received: 20 EMS units, 1 pumper, 1 bomb unit, 2 bomb support units** • **230 DOT-mandated vehicle inspections performed** • **30 pumps, 26 aerial devices, and 8165 feet of ground ladders tested** • **Preventative maintenance performed on 84 cots and 18 hydraulic rescue systems**

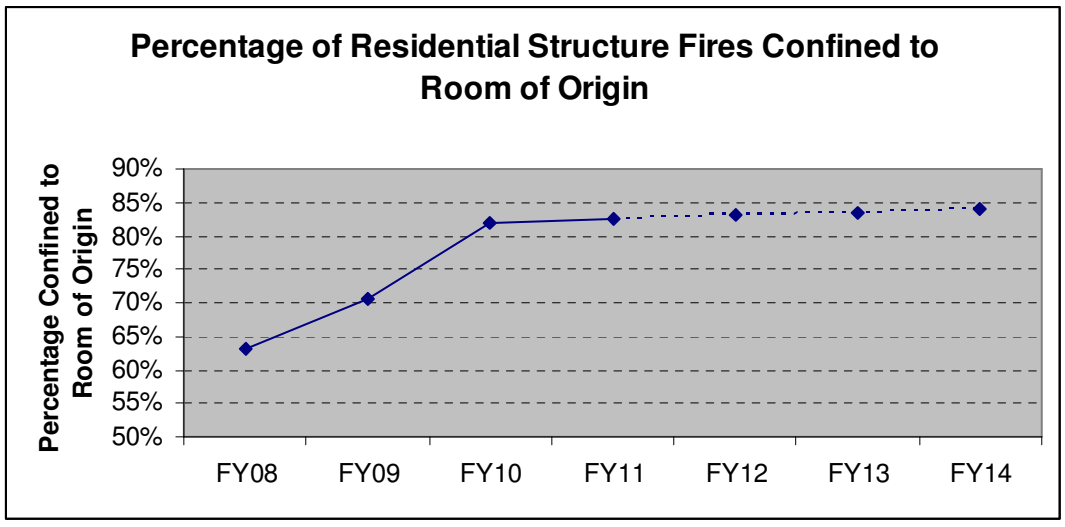
MCFRS HEADLINE PERFORMANCE MEASURE #1

PERCENTAGE OF RESIDENTIAL STRUCTURE FIRES CONFINED TO THE ROOM OF ORIGIN

1 – CONTRIBUTION TO MONTGOMERY RESULTS

- **Safe Streets and Secure Neighborhoods**

2 – PERFORMANCE



The solid line in the above graph represents actual historical data for FY08-11. The dashed line indicates projected performance based on additional fire suppression resources placed in service associated with new fire stations to be opened.

3 – STORY BEHIND THE PERFORMANCE

Many factors contribute to and restrict the ability of MCFRS to confine residential structure fires to the room of origin. These factors are presented below in priority order.

RESTRICTING FACTORS

FACT: For each minute of fire growth (absent suppression actions) in a residential structure, the fire generally doubles in size!

a. **Response time exceeding goal**: As illustrated and addressed in Performance Measure #2, MCFRS is not fully meeting the County Council-adopted response time goal of 6 minutes[1] for first-due engine on structure fires. After 6 minutes, the chances of containing a fire to the room of origin are greatly reduced, with flashover (i.e., the point at which the room of origin becomes fully engulfed in flames instantaneously) typically occurring within 6 to 9 minutes of ignition[2]. Once flashover has occurred, fire will spread rapidly beyond the room of origin.

b. **Insufficient suppression resources**: The County lacks sufficient suppression capabilities in areas experiencing the highest rate of growth – suburban areas and, to a lesser extent, rural areas – where there are gaps in 6-minute response coverage due to an insufficient number of fire stations and suppression resources. In addition, fire and EMS service demand is increasingly causing engines (many ALS engines) stationed closest to a reported residential fire to be unavailable. When the first-due engine is unavailable to respond, the next closest engine is dispatched as the first-due engine which increases the distance and time the unit must travel to reach the fire; thus allowing the fire to grow in size and intensity, absent automatic sprinkler activation.

c. **Inadequate staffing levels on suppression units**: By the end of FY11, 51% of MCFRS frontline engines and aerial units (both breeds combined)[3] had the NFPA 1710 minimum recommended staffing level of four personnel around the clock. The other 49% had guaranteed staffing of only three personnel; occasionally greater than three depending upon volunteer staffing levels. The Maryland Occupational Safety and Health Administration's "2 in – 2 out" rule requires, whenever an IDLH[4] condition is present, that two firefighters with a charged hose line be in place outside a burning structure (serving as a rescue team) before a two-person entry team is allowed to enter the structure to attack the fire.[5] In rural and suburban areas where

[1] Goal is 6 minutes to 90% of fires in urban zone, 75% of fires in suburban zone, 50% of fires in rural zone

[2] An increasing number of fires reach flashover in four minutes or less due to changes in furnishings from natural to synthetic materials and open floor designs. Due to these changes, many fires will reach flashover before being reported; therefore, confining the fire to the room of origin will be improbable if not impossible.

[3] 71% (24 of 34) frontline engines and 7% (1 of 15) aerial units had four-person guaranteed staffing.

[4] IDLH – immediately dangerous to life and health

[5] The only exception to the "2 in - 2 out" rule is when it is evident or believed that occupants are trapped inside the burning structure; wherein the two-person entry team may enter the structure without the two-person rescue team in place.

the first-due engine may be the sole unit on-scene for several minutes, interior firefighting cannot be initiated until the next primary unit arrives and the "2-out" requirement is satisfied.

CONTRIBUTING FACTORS

a. **Early fire detection:** Detection of fires while in their initial stage allows early reporting to the Emergency Communications Center (ECC) which, in turn, leads to quicker dispatch and response of fire suppression resources. Residential fire detection systems that send a signal to a central monitoring service ensure the ECC is notified quickly[6], even when residents are not home. When smoke alarms are not monitored, residents or persons passing by must contact the ECC themselves which may result in delayed reporting of the fire which then results in delayed response.

b. **Presence of a sprinkler system**: Automatic sprinkler systems are a resident's best defense against a serious fire because sprinklers confine or extinguish fires, save lives, and reduce property damage. Residential sprinklers are designed to operate in the early stages of a fire; thus controlling or extinguishing flames before spreading beyond the room of origin. Sprinklers have been mandated by Montgomery County for multi-family and commercial structures since the late 1980s and for all new single-family homes since 2004. MCFRS has documented numerous instances when an incipient fire was extinguished by sprinklers; therefore not spreading beyond the room of origin.

c. **Readily available and sufficient quantity of water**: Water is not readily available and in sufficient quantity throughout much of the County's non-hydranted area; however, MCFRS is in the process of enhancing water delivery in rural areas. During FY10, MCFRS completed the implementation of the department-wide capability to suppress fires with compressed-air foam (CAF) through its new fleet of 39 CAF system-equipped (CAFS) pumpers. CAF extinguishes fire quicker and more effectively than larger quantities of water alone and prevents re-ignition during salvage and overhaul operations. Other equipment on the new pumpers that contribute to water delivery and pumping capacity include large volume pumps (1500 gpm) and greater amounts of large-diameter (≥4-inch) hose which allows MCFRS to move greater quantities of water greater distances with fewer resources. When MCFRS acquires a new tanker for Germantown-Kingsview Station 22, that will become the seventh frontline tanker of 3000-3500 gallon capacity in the MCFRS fleet and allow Tanker 714-B (presently on loan to Station 22) to become the County's first reserve tanker.

[6] Ensures quick notification, with occasional exceptions

d. **Appropriate suppression strategy and tactics**: Through use of "RECEOVS" tactics[7], the first hose line is immediately advanced to the room of origin to confine the fire and protect any trapped occupants as well as firefighters searching for them.

e. **New fire stations in Germantown**: In September 2010, the second of two new fire stations in Germantown opened, one on the west side and one on the east side of town[8]; thus increasing the number of engines in this high-growth area by two. This increases the depth of resources in the up-county and should result in faster response; thus increasing the percentage of residential fires confined to the room of origin.

f. **Phase 3 of four-person staffing:** Four-person staffing allows the first-arriving engine to begin interior fire attack immediately without having to wait for another unit to meet State "2 in – 2 out" requirements. Quick interior attack leads to achievement of a higher percentage of fires confined to the room of origin and reduces the number of resources required for fire suppression, thus preserving capacity for additional incidents. Phase 3B of four-person staffing could occur in FY13 if County funding or federal grant (e.g., SAFER) funding were to materialize.

g. **Other contributing factors**: Other factors contributing to the confinement of residential fires to the room of origin include well-trained firefighters as well as code-compliant construction. Well-trained firefighters ensure the effectiveness of fire suppression tactics, and code-compliant construction results in early detection and fire department notification, early suppression, or compartmentalization of fires; thus preventing or slowing the spread of flames beyond the room of origin.

WHAT WE PROPOSE TO DO TO IMPROVE PERFORMANCE

To maintain the MCFRS' initial goal of confining fires to the room of origin in 80% of residential fires, MCFRS plans to continue implementing the following actions and programs during FY12 and FY13:

a. **Reduce response time**: Response time to residential fires can be further reduced county-wide by continuing measures implemented during FY10-11 to reduce ECC call-processing and dispatch time and by improving turnout time. Upgrades to the County's emergency communications system, including the computer aided dispatch (CAD) system and station alerting system, will be planned during FY12 and will lead to faster ECC call-processing and dispatch; thus improving overall response time. [Note: Response time is further addressed in Measure #2.]

[7] Basic firefighting strategy and tactics are based on the RECEOVS concept which identifies fire ground priorities as: **r**escuing occupants, covering **e**xposures, **c**ontrolling the fire, **e**xtinguishing the fire, and conducting **o**verhaul, **v**entilation and **s**alvage operations.

[8] Germantown-Kingsview Station 22 opened in March 2009, and Germantown-Milestone Station 34 opened in September 2010.

b. **Continue implementation of 4-person staffing**: Continued implementation of Phase 3 of MCFRS' four-person staffing plan is planned for FY12 should federal SAFER grant moneys be awarded to the County, whereby additional down-county engines would have a fourth position staffed on a 24/7 basis. Four-person staffing of engines allows the first-arriving engine to begin interior fire attack immediately without having to wait for another unit to meet "2 in – 2 out" requirements of the Maryland Occupational Safety & Health Administration. The fourth person provides for improved safety of firefighters and the ability to deploy hose lines quicker and achieve rapid rescue of persons trapped by fire.

c. **Improve water availability**: Through continued efforts to improve Insurance Services Office (ISO)-issued fire protection ratings for Montgomery County (i.e., Class 4 in hydranted areas and Class 9 in non-hydranted areas), MCFRS will take steps to increase the number of ISO-certified static water supply sources throughout areas lacking hydrants. This will involve the installation of strategically located cisterns as well as the installation of dry hydrants and improved vehicle access to drafting sites (e.g., lakes, ponds, streams).

d. **Compressed-air foam** – With county-wide deployment of compressed-air foam system (CAFS) pumpers, MCFRS should achieve faster control and extinguishment of fires. CAFS results in a 40% reduction in the weight of any attack line which allows faster advancing of the attack line plus faster knockdown of the fire due to CAFS dual action of cooling and smothering the fire.

e. **Retrofit unsprinklered residential high-rises**: To address the County's 80+ high-rise and mid-rise apartment buildings lacking sprinkler systems, MCFRS will continue advocating for legislation requiring sprinkler retrofitting. The MCFRS Code Compliance Section will also continue working with the Apartment and Office Building Association to encourage building owners to voluntarily install sprinklers to increase occupants' safety and to realize savings on insurance premiums. [Sprinkler retrofitting is further addressed in Measure #3.]

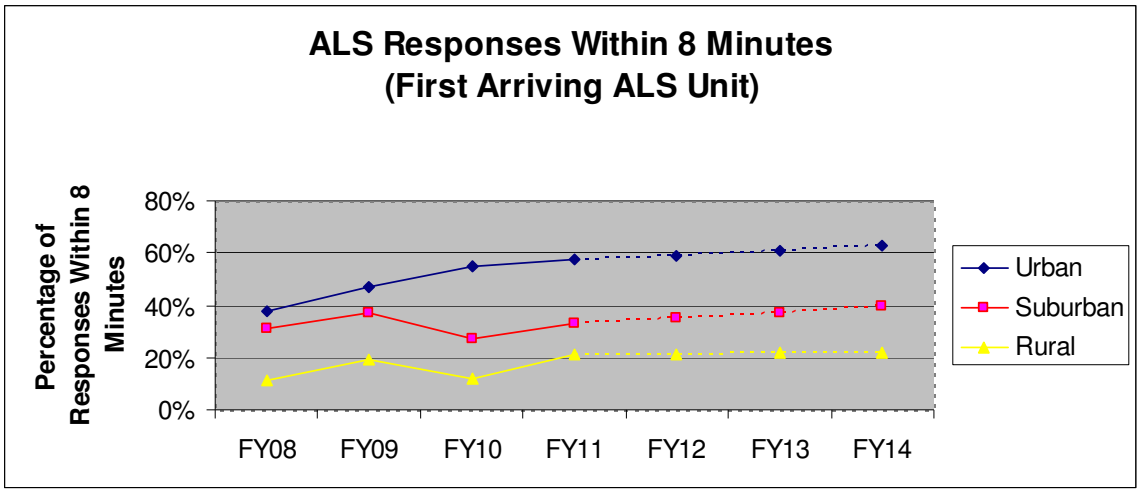
MCFRS HEADLINE PERFORMANCE MEASURE #2

RESPONSE TIME TO ADVANCED LIFE SUPPORT AND STRUCTURE FIRE INCIDENTS

1 – CONTRIBUTION TO MONTGOMERY RESULTS

- **Safe Streets and Secure Neighborhoods**

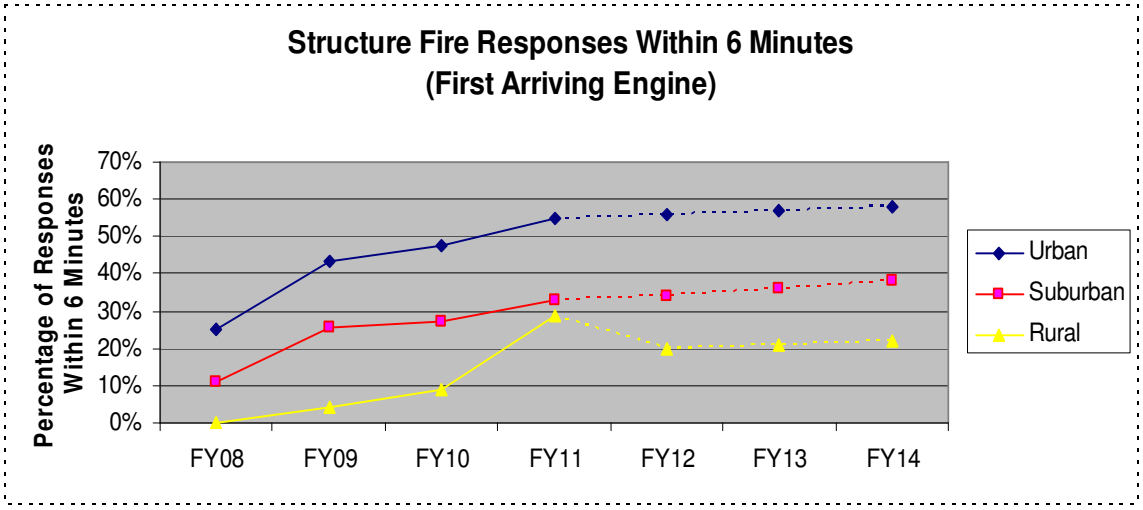
2 – PERFORMANCE



The graph above indicates response performance relating to advanced life support (ALS) incidents. Solid lines indicate actual historical data for FY08-11, and dashed lines indicate projected performance for FY12-14. An ALS unit, in the context of this performance measure, is a Medic Unit or ALS first-responder apparatus (AFRA) such as an engine having a firefighter-paramedic on board. ALS units provide the highest level of pre-hospital patient care based on advanced training of personnel and specialized equipment carried. It is important to note that this graph does not reflect response time of basic life support (BLS) first-responders (i.e., EMT-Bs aboard an ambulance, engine, or other unit), often arriving before ALS units. The response time goal for a BLS first-responder unit to an ALS incident is 6 minutes compared to 8 minutes for the ALS unit. BLS first responders are trained, certified, and equipped to perform basic life support

services, including life saving actions such as rescue breathing, cardiopulmonary resuscitation (CPR), and use of automated external defibrillators (AEDs).

The graph below indicates response performance relating to structure fires. Solid lines indicate actual historical data for FY08-11, and dashed lines indicate projected performance for FY12-14.



3 – STORY BEHIND THE PERFORMANCE

Several factors contribute to or restrict the ability of MCFRS to reach the scene of life-threatening medical emergencies and structure fires in time to save lives, prevent injuries, and have a major impact on minimizing property damage. These factors are presented below in priority order.

RESTRICTING FACTORS

FACT: For each minute that elapses following cardiac arrest, absent the provision of effective cardiopulmonary resuscitation and/or defibrillation, the patient's chances of survival decease by approximately 10%.

a. **9-1-1 call-taking, call processing, and dispatching of units:** During the first seven months of FY10, the ECC staff averaged about 2.4 minutes per 9-1-1 call[9] for ALS and structure fire incidents; obtaining vital information from those reporting emergencies, processing that information, and dispatching appropriate fire-rescue units. Time-consuming protocols (e.g., State-mandated Emergency Medical Dispatch protocol) and a cumbersome computer-aided dispatch system are largely responsible for these elevated

[9] Average call processing time is almost equal for ALS incidents and full-assignment (fire) incidents

times.[10] It is noteworthy, however, that call processing and dispatch time has improved to an average of 75 seconds due to procedural changes that have reduced call processing /dispatch time for the most critical call types: ALS-Echo, ALS-2, and full-assignment (fire) incidents. The current limiting factor is the technology, both hardware systems in the form of an outdated CAD hardware and software. Future CIP will address this technology issue. Additionally, planning is underway to further improve the business model by converting to Universal Call-Takers in cooperation with the MCP.

b. **Turnout time**: The average turnout time[11] for ALS and full-assignment (fire) incidents during FY10 was about 78 seconds (≈1.3 minutes). The average turnout time for ALS incidents (ALS-1, ALS-2 and Echo incidents combined) during FY10 was about 80 seconds (≈1.35 minutes), ranging from about 71 seconds (≈1.2 minutes) for an Echo-level incident to about 82 seconds (≈1.4 minutes) for an ALS-1 incident. The average turnout time for full-assignment (fire) incidents during FY10 was about 65 seconds (≈1.1 minutes). Turnout time for full assignments (fire) is typically less than that for ALS incidents (all categories combined) due to use of the pre-alert which provides personnel an advanced notification of a full-assignment (fire) to be announced. It is noteworthy that turnout times for ALS incidents have improved by about 10% (≈8 seconds) since FY09 but will need to be reduced further to achieve the 1-minute standard established in NFPA 1710 and by CFAI in their own "benchmark" standard.

Factors impacting turnout time include: distance personnel must travel within the station to reach apparatus, safety requirements (i.e., donning protective gear and fastening seat belts before departure), and perceived urgency of the incident (e.g., a structure fire incident with the potential for trapped occupants will typically prompt a faster turnout than would an ALS-1 incident).

c. Travel time: Travel time for responding MCFRS apparatus is an issue in much of the County, particularly in suburban and rural areas where stations and their resources are further apart than in urban areas. Travel time issues can be broken down into three primary factors; each described below.

- **Insufficient resources:** See item "b" under Restricting Factors in Performance Measure #1. The problem applies to EMS resources as well as fire resources.

- **Insufficient staffing levels on suppression units:** See item "c" under Restricting Factors in Performance Measure #1.

[10] NFPA Standard 1221 states that ECC call-taking, call processing, and dispatch should require no more than 1.0 minute for EMS incidents and 1.3 minutes for fire/special operations incidents. The CFAI's "benchmark" standard allows 1.0 minute for call processing for all fire, rescue, and EMS emergencies; while their "baseline" standard allows 1.5 minutes.

[11] Turnout time is the time between dispatch of units and departure of units from their station.

- **Road/traffic conditions:** Traffic congestion has a negative impact on response time as do road conditions such as potholes, wetness, ice/snow, traffic calming devices, and road construction zones.

CONTRIBUTING FACTORS

a. **Station distribution within urban areas**: The down-county area, in general, has an adequate distribution of fire-rescue stations and resources which positively impact response time. Consequently, response times in the down-county are closest to established goals than elsewhere in the County.

b. **New up-county stations**: Two new fire stations have opened in the Kingsview and Milestone areas of Germantown during FY09 and FY11. The EMS and fire suppression resources deployed at these new stations have reduced, and will continue reducing, response times in these high call volume areas of the up-county.

c. **Implementation of four-person staffing**: Implementation of Phases 1, 2 and 3A of the MCFRS' four-person staffing strategy between FY07 and FY10 has added a fourth person on a 24/7 basis to 24 engines and one aerial unit. These four-person units, having one firefighter-paramedic and three firefighters on board, serve as ALS first-responder apparatus (as well as fire suppression units) to greatly increase the ALS capacity of the department. One major result of this deployment has been improved ALS response time county-wide.

d. **Modification of ALS Call Processing and Dispatch**: Fire Chief's General Order 09-07 was implemented in 2009 to modify the procedure for ALS call processing and dispatch. ALS calls were designated as ALS-1 (requiring one ALS provider) or ALS-2 (requiring two ALS providers). ALS-2 calls are the most critical life-threatening emergencies – Echo and certain Delta calls – where two paramedics are required. With ALS-2 calls, ECC personnel do not have to wait until the conclusion of the time-consuming EMD protocol to dispatch ALS units; thus improving call processing /dispatch time as well as overall response time. With ALS-1 calls, ECC personnel must wait until the conclusion of the EMD protocol to dispatch ALS units.

e. **New roads**: The opening of new roads provides MCFRS units more direct routes of travel to incidents as well as more alternatives when preferred routes of travel are congested or blocked. When completed, the Inter-County Connector and Montrose Parkway East will result in improved response times in portions of the County served by these roads.

WHAT WE PROPOSE TO DO TO IMPROVE PERFORMANCE

To move toward meeting the MCFRS' response time goals for ALS incidents and structure fires, MCFRS plans to pursue the following actions, programs, and initiatives during FY12 and FY13:

a. **Reduction in time taken to process 9-1-1 calls and dispatch units**: Resources and procedural changes that are needed to accomplish this reduction include:
    - Modification of time-consuming State and County protocols and procedures that unnecessarily delay call-processing and dispatch
    - Upgrades to the County's communications system, including the computer aided dispatch (CAD) system and station alerting system, are being planned (ref. Public Safety Systems Modernization Plan) and will lead to faster ECC call-processing and dispatch as well as faster turnout time

b. **Reduction in turnout time:** Resources and procedural changes that are needed to accomplish this reduction include:
    - Strict supervision by MCFRS battalion chiefs, station commanders, and unit officers to ensure personnel are meeting Operations Division turnout goals
    - Strategic use of pre-alerts that should result in faster turnout times
    - Replacement of the station alerting system

c. **Reduction in travel time:** Resources and procedural changes that are needed to accomplish this reduction include:
    - Strategically placed stations – to be accomplished by adding new stations (e.g., Station 32 in FY13) and, where appropriate, relocating existing stations
    - Full implementation of the four-person staffing plan and 1 and 1 ALS model
    - Deploying additional apparatus/staff strategically
    - Continued community outreach campaign (i.e., "Hear Us, See Us, Clear for Us" campaign initiated in FY06) that encourages motorists and pedestrians to yield right-of-way to responding fire-rescue vehicles
    - To the greatest extent possible, use of response routes lacking traffic calming devices (i.e., speed humps, traffic circles)

d. **Reduction of false alarms:** The Fire Code Compliance Section will be emphasizing enforcement in existing buildings which includes targeting buildings that have repeated false alarms.
    - Data from 2009 indicates that approximately 25% of the automatic fire alarm (AFA) calls (1,160 of 4,318) originated from 117 buildings. The majority of AFA responses results from system malfunctions and is unnecessary.
    - Fire Code Compliance will enforce existing local and state regulations that address recurrent false alarms to eliminate unnecessary responses.
    - Unnecessary responses that result from human behavior issues (e.g., repeated smoke activations from burnt toast) will be referred to MCFRS Community Outreach Section for remedial action.
    - Reduction in the number of unnecessary responses will reduce service demand, the need for response from secondary and tertiary stations, and improve response times.

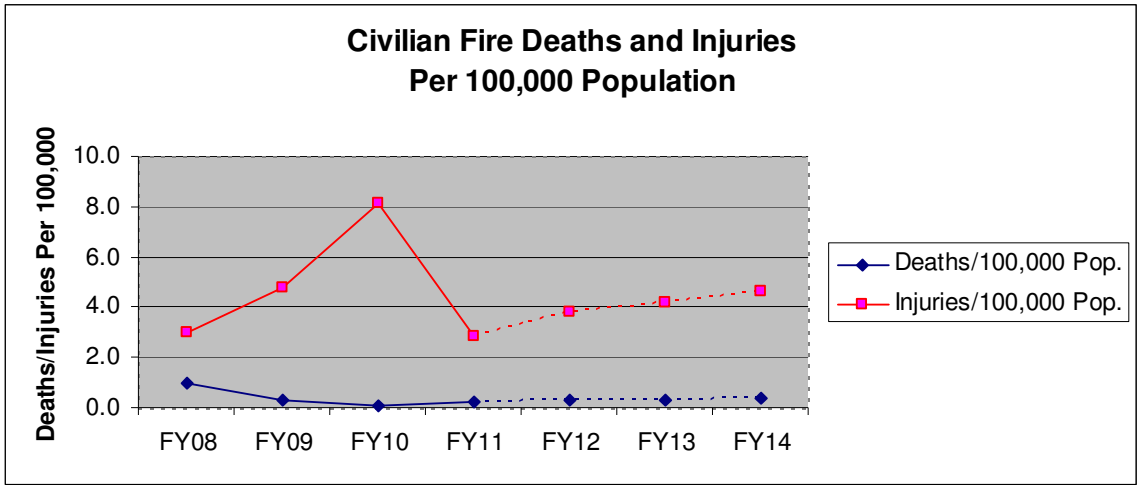
MCFRS HEADLINE PERFORMANCE MEASURE #3

NUMBER OF RESIDENTIAL FIRE DEATHS AND INJURIES [PER 100,000 RESIDENTS]

1 – CONTRIBUTION TO MONTGOMERY RESULTS

- **Safe Streets and Secure Neighborhoods**

2 – PERFORMANCE



The graph above indicates the annual number of past and projected civilian fire **deaths** (blue line) and past and projected number of civilian fire-related **injuries** (red line).

The red line (fire deaths) is projected to remain approximately flat in FY11 and FY12 due to initiatives and programs described below under "Contributing Factors" and "What We Propose to do to Improve Performance." Absent the initiatives and programs described below, the projected number of deaths would likely be higher.

The blue line (fire-related injuries) is projected to decrease each year between FY11 and FY12. The decrease reflects initiatives and programs described under "Contributing Factors" and "What We Propose to do to Improve Performance." Absent these initiatives

and programs, the projected number of civilian fire-related injuries would likely be higher.

3 – STORY BEHIND THE PERFORMANCE

Many factors contribute or restrict the ability of MCFRS to prevent civilian fire casualties (i.e., deaths and injuries). These factors are presented below in order of priority.

RESTRICTING FACTORS

FACT: The majority of fire deaths in Montgomery County are caused by smoking, and half of the fire fatalities that have occurred since 2003 have involved residents 65 years and older.

a. **Residents' Behavior**: Behaviors exhibited by residents is a significant factor in residential fires resulting in casualties. Unsafe house-keeping practices (e.g., storing combustibles close to heat sources) and unsafe daily practices (e.g., smoking in bed; unattended stoves) exhibited by some residents cause many fires that are preventable. Improper behavior by some residents during fires, such as attempting to fight the fire instead of evacuating, or re-entering the burning residence after evacuating, has led to fire casualties as well.

b. **Demographic factors**:

- **Age**: Seniors (age 65 and above) and young children (age 5 and under) have the highest rates of injury and death in residential fires in Montgomery County as well as the State and nation. Alertness, mobility, and decision-making abilities are limitations associated with these age groups.

- **Socio-economic level**: Residents having lower household incomes are much more likely to become injured or killed in a residential fire than residents having higher household incomes.

- **Race/Ethnicity**: Race and ethnicity have a major bearing on residential fire deaths. Persons of certain races and ethnic groups are more likely to be killed in residential fires than others, based upon historical statistics.

c. **Lack of functioning smoke alarms**: Despite County and State laws requiring smoke alarms in residences, some residences lack these life-saving devices while others have smoke alarms, but they are non-functional due to lack of batteries, dead batteries, or age/condition of the smoke alarm itself. According to data from the National Fire Protection Association, lack of a working smoke detector is a factor in approximately 65% of all fatal fires.

d. **Smoking**: Careless use and disposal of smoking materials (i.e., cigarettes and cigars) has long been the primary cause of residential fire deaths in Montgomery County. In most cases, lit smoking materials come in contact with combustible bedding, furniture or clothing when smokers fall asleep and/or are incapacitated due to use of alcohol, medications, or other substances. Improper disposal of smoking materials is a less frequent cause of fires resulting in civilian casualties.

e. **Lack of sprinklers**: Residential high-rises and mid-rises, garden apartments, townhouses, and single-family homes pre-dating sprinkler laws present a significant risk to occupants. Without sprinkler protection, the chance of residents being injured or killed during a serious fire is fairly high, more so if smoke alarms are not present or not functioning to provide early warning.

CONTRIBUTING FACTORS

a. **Community outreach**: MCFRS has a robust community outreach program to educate the public about fire prevention, fire safety, and risk reduction. Elements of the program are targeted at high risk groups such as seniors, young children, and low-income residents. A County-sponsored task force produced a report in 2008 that identified critical areas of focus to improve fire safety for seniors and reduce the high incidence of fatal fires involving seniors.

b. **Sprinklers**: See item "b" under Contributing Factors in Performance Measure #1.

c. **Flammability standards for cigarettes**: Maryland is one of many states with laws in effect requiring that cigarettes sold within the State must be of the design known as "fire safe" cigarettes. The technology uses internal bands of thick paper spaced at about half-inch intervals that serve to stop the combustion process unless the smoker draws upon the cigarette to provide sufficient oxygen to keep it burning. A carelessly discarded or dropped cigarette of this design is more likely to burn itself out, presumably before igniting nearby combustibles. New York was the first state to require flammability standards for cigarettes and since has observed a reduction in their annual fire deaths of approximately 50%. Results for Maryland are not yet available due to the limited amount of data reported by the counties to date.

WHAT WE PROPOSE TO DO TO IMPROVE PERFORMANCE

To improve the MCFRS' ability to prevent residential fire deaths and injuries, the department plans to pursue the following actions and initiatives during FY12 and FY13:

a. Community outreach: Continue fire prevention and risk reduction educational programs focused on targeted populations (e.g., elderly, children, and immigrant populations) as well as long-standing programs having a more general application. All members of the fire-rescue service have responsibility to reduce community risk.

b. Implementation of recommendations concerning senior citizen fire safety: Emphasis will be placed on implementing low-cost recommendations of the Senior Citizen Fire Safety Task Force. A number of projects have begun to raise awareness among people who provide direct service and support within senior's homes to identify people who may be at a greater risk and may need assistance installing smoke alarms or reducing risk in other ways.

c. Sprinkler retrofitting: See item "e" under "What We Propose to do to Improve Performance" in Headline Measure #1.

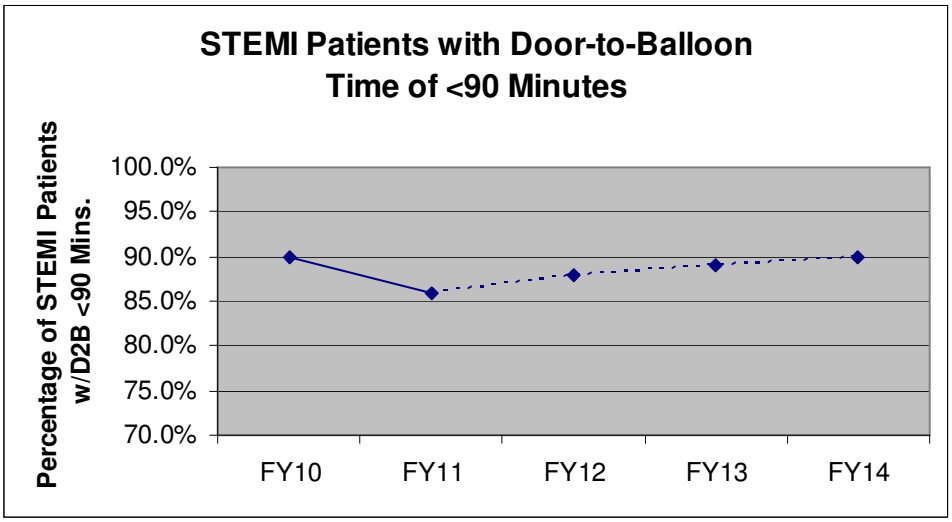
MCFRS HEADLINE PERFORMANCE MEASURE #4

Pre-Hospital Cardiac Care

1 – CONTRIBUTION TO MONTGOMERY RESULTS

- **Safe Streets and Secure Neighborhoods**

2 – PERFORMANCE



MCFRS Performance Data

The solid line in the above graph represents actual historical data for FY10 and FY11. The dashed line indicates projected performance based on the average of previous quarters as well as derived benefits of programmatic actions, initiatives, and resource enhancements to be implemented. In addition, it should be understood that FY11 data combines "traditional" door-to-balloon ("D2B") times as well as data for the newly-implemented Lifenet program which began in May 2011. [See below for a more detailed explanation of this program.] MCFRS EMS personnel activated the ST-segment elevation myocardial infarction (STEMI) response system 167 times during FY11. For patients who were transported by MCFRS and received primary percutaneous coronary intervention (PCI) in a Montgomery County hospital, 91% on average had a door-to-balloon time less than 90 minutes. **This percentage achieved is well above the**

required 75 percent necessary for hospitals to maintain their waiver to perform PCI in Maryland.

3 – STORY BEHIND THE PERFORMANCE

Indicator: The goal of MCFRS is to have 90% of EMS-identified ST-segment elevation myocardial infarction (STEMI) patients receiving balloon angioplasty in a cardiac catheterization lab within 90 minutes of arrival at the hospital.

This performance measure quantifies the clinical skills that the MCFRS utilizes to treat pre-hospital cardiac patients. The basis for this assessment is the national best practices model for EMS systems as published in the April 2008 National Association of EMS Physicians Journal, *Pre-hospital Emergency Care*.

The MCFRS provides a tiered level of response for pre-hospital emergency care. Customer satisfaction levels based on post-incident mailings have traditionally been very high. The current challenge for the EMS system is to quantify in specific, focused terms the treatments that improve cardiac patient outcome.

Considering available technology, current statistical accounts in medical journals, and emerging cardiac management, the MCFRS is a model pre-hospital cardiac care system. The MCFRS has in place the components to provide state-of-the-art pre-hospital cardiac care at the local level. Additionally, the Maryland Institute of Emergency Medical Services Systems (MIEMSS) is providing State direction in the designation of cardiac treatment centers, including four in Montgomery County. This combination of EMS direction, experience, and knowledge, partnered with a local network of cardiac care specialty centers, places the MCFRS in a solid position to provide fast and effective cardiac care to the residents of Montgomery County.

<u>Standard for Measurement</u>

Door-to-balloon ("D2B") time is a measurement in emergency cardiac care, specifically in the treatment of ST-segment elevation myocardial infarction (STEMI). The interval starts with the patient's arrival in the emergency department and ends when a catheter guide wire crosses the culprit lesion in the cardiac catheterization lab. Because of the adage that "time is muscle" (i.e., delays in treating a myocardial infarction increase the likelihood and amount of cardiac muscle damage due to localized hypoxia), American College of Cardiology/American Heart Association guidelines recommend a D2B interval of no more than 90 minutes. Currently, fewer than half of STEMI patients nationwide receive reperfusion with PCI within the guideline-recommended timeframe.

With the implementation of 12 Lead EKG capabilities amongst virtually all mid to large-sized EMS operational programs nation-wide, a new component of measuring the success of medical intervention for STEMI patients now includes an EMS-to-Balloon (E2B) time.

This measurement begins at the time of the first qualifying EKG performed by EMS personnel, and ends under the same criteria as D2B times. A 2009 study cited in the American Journal of Cardiology states, in reference to E2B times, "there [is] data supporting E2B as a reasonable metric for STEMI systems; (measuring) EMS, emergency medicine and the cath lab all on the clock whereas D2B only focuses on the emergency department and cath lab and doesn't incorporate EMS."

Percutaneous Coronary Intervention

Percutaneous coronary intervention (PCI) encompasses a variety of procedures used to treat patients with diseased arteries of the heart. One example is chest pain caused by a build-up of fats, cholesterol, and other substances from the blood (i.e., "plaque") that can reduce blood flow to a near trickle. Another example is a heart attack caused by a blood clot that completely blocks the artery.

Typically, PCI is performed by threading a slender balloon-tipped tube – a catheter – from an artery in the groin to a trouble spot in an artery of the heart (i.e., percutaneous tranluminal coronary angioplasty – PTCA, or "balloon angioplasty"). The balloon is then inflated, compressing the plaque and dilating (widening) the narrowed coronary artery so that blood can flow more easily. This is often accompanied by inserting an expandable metal stent – a wire mesh tube used to prop open arteries following PTCA.

RESTRICTING FACTORS

a. Individual Behavior: Behaviors exhibited by individuals is a significant factor in the timely activation of the STEMI response. One of the most common symptoms of an individual experiencing a cardiac event is denial. Many people will attribute their symptoms (chest pain, trouble breathing, weakness, nausea, sweating) to other illnesses. Individuals will also contact inappropriate health care professionals such as their private physician or urgent care clinics rather than dialing 9-1-1 to initiate an EMS response.

b. Patient Stability: The most unpredictable and difficult to impact is patient stability. Stability refers to the co-morbid factors that a given patient presents at the emergency department of the hospital. Circumstances such as post cardiac arrest, severe respiratory distress, and hemodynamically challenging patients will often experience a delay in movement from the emergency department to the cardiac catheterization lab so that the patient can be stabilized and hopefully have an increased chance for a positive outcome. FY11 - Quarter 1 demonstrated an unusually difficult quarter with many of the patients requiring lengthy stabilization prior to having PCI.

c. Demographic factors:

- **Age**: The elderly become more likely to suffer a cardiac event as advanced age is a risk factor for heart disease. As an individual grows older, their pain

sense decreases which causes a decrease in obvious symptoms. The elderly patient may have more subtle symptoms that are sometimes ignored as unimportant, causing a delay in response.

- **Gender:** Women are more likely to have atypical symptoms during a cardiac event. They often experience weakness, back pain, and "indigestion like" discomfort rather than the typical chest pain that is more commonly discussed.

- **Race/Ethnicity**: Race and ethnicity have some bearing on the appropriate activation of EMS for cardiac events. Language barriers between the patient and the 9-1-1 call-takers and responders create an obvious obstacle. In addition, religious-based beliefs or the distrust of governmental agencies can create a critical delay.

CONTRIBUTING FACTORS

a. Emergency Medical Dispatch (EMD): MCFRS utilizes a nationally recognized Emergency Medical Dispatch protocol to ensure the appropriate level of care is sent to each medical emergency in the County. With this protocol, a patient experiencing a medical emergency that could be cardiac related automatically receives the highest priority response.

b. Tiered response: Once EMD has categorized the event as possibly cardiac in nature either by specific symptoms or relevant unknowns, the priority response will include the closest basic life support responder, the closest advanced life support responder, and the closest advanced life support transport unit. The basic life support response will initiate stabilizing care while the advanced life support response will quickly determine if the patient is experiencing a STEMI.

c. ACLS-trained providers: A major contributing factor is the skill of the EMS providers to recognize the STEMI patient quickly, provide early notification and EKG transmission (see section on Lifenet system) to the receiving facility, and initiate care for the patient; thereby expediting the patient's movement to the cardiac catheterization lab soon after arriving at the hospital.

d. 12 lead capability: Every ALS unit (AFRA or MICU) is equipped with a cardiac monitor capable of performing a 12-lead ECG. This assures that the ALS providers can quickly identify a STEMI patient and relay that information to the receiving facility.

e. Lifenet©: In May 2011, the Lifenet system was deployed at all four Montgomery County PCI hospitals. Implementation of this new technology was made possible by a partnership with the four participating hospitals: Holy Cross, Shady Grove Adventist, Suburban, and Washington Adventist. The system allows EMS personnel

on scene to transmit the first diagnostic EKG directly to the receiving hospital where it is read immediately by members of the STEMI response team. This allows a more efficient response by the hospital staff and will decrease D2B time for the patient. Thus far, the system is working well and a significant decrease in D2B times for these patients is noted.

f. Electronic Patient Care Report (EPCR) Analysis: The MCFRS EMS Section gathers data to demonstrate utilization of critical cardiac skills and the impact to the community. Patient outcome data demonstrates the effectiveness of these skills. MCFRS has implemented a program in which this data is reviewed on a daily basis both for medical quality assurance and to consider adjustments in the Emergency Medical Dispatch (EMD) process to further focus on deployment of best resources

WHAT WE PROPOSE TO DO TO IMPROVE PERFORMANCE

a. Community outreach: One responsibility of the MCFRS Community Outreach Section is educating the public about recognition of medical emergencies and proper actions to be taken. Through the use of data obtained through the MCFRS' Electronic Patient Care Reporting system, the department can continue to hone its outreach efforts to those groups of individuals at greatest risk for delay in entering the response system for emergency cardiac care.

b. Training: The MCFRS EMS Section, in conjunction with the Public Safety Training Academy, trains all new ALS providers in Basic 12 Lead EKG recognition and treatment. Additional training in Advanced 12 Lead recognition is a component of the continuing education cycle for all ALS providers.

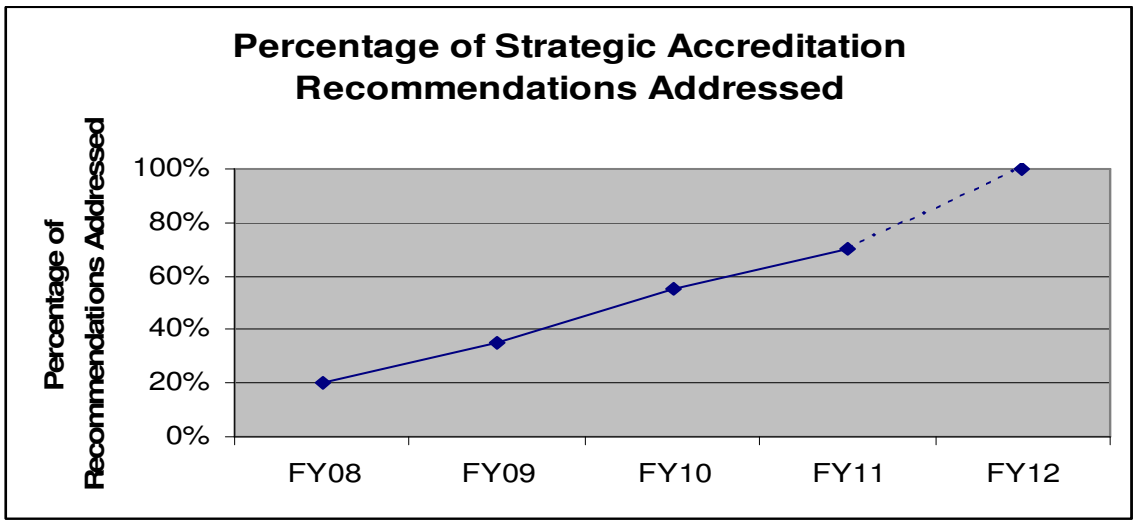
MCFRS HEADLINE PERFORMANCE MEASURE #5

PERCENTAGE OF STRATEGIC RECOMMENDATIONS ADDRESSED CONCERNING ACCREDIATION FOLLOW-UP REQUIREMENTS

1 – CONTRIBUTION TO MONTGOMERY RESULTS

- **Safe Streets and Secure Neighborhoods**

2 – PERFORMANCE



3 – STORY BEHIND THE PERFORMANCE

In April 2007, MCFRS was evaluated by a Peer Assessment Team from the Commission on Fire Accreditation International (CFAI) which determined that MCFRS met CFAI's competency criteria. Based upon that assessment, CFAI's parent organization – the Center for Public Safety Excellence - awarded accreditation status to MCFRS in August 2007. As of June 2011, MCFRS was the only accredited fire department in Maryland, one of approximately 150 accredited fire departments worldwide, and the largest combined (i.e., career and volunteer) department to hold accreditation status.

In addition to receiving accreditation status, MCFRS was given a list of recommended follow-up actions by the CFAI Peer Assessment Team addressing several areas needing

improvement. MCFRS submitted an annual progress report to CFAI in July 2011 describing progress made in these areas. A favorable review by the CFAI Board will allow MCFRS to maintain its accreditation status for another year. Five years after its initial 2007 accreditation, MCFRS will attempt to become accredited once again by completing the entire process in 2012.

WHAT WE PROPOSE TO DO TO IMPROVE PERFORMANCE

To maintain its accreditation annually (between 2008 and 2011), MCFRS must – among other requirements - address the strategic recommendations provided by the CFAI Peer Assessment Team in 2007. The list below summarizes and consolidates these recommendations. MCFRS must show progress in its annual compliance report to the CFAI Board of Directors to maintain its accreditation status between 2008 and 2011. The ongoing plan has been to continue addressing annually about 20% of the overall workload associated with acting upon CFAI's strategic recommendations, summarized as follows:

- Upgrading of the department's data management system to match the complexities and demands of the department
- Redefining current service level objectives presented in the "MCFRS Standards of Cover" document submitted to the Peer Assessment Team in 2007
- Developing a clear and well-defined plan to overcome the sizeable gap between the current service level objectives and the response time goals stated in the 2005-2015 MCFRS Master Plan
- Analyzing the effectiveness of call processing procedures in use at the ECC
- Conducting a detailed feasibility study of the current tiered response for emergency medical calls
- Conducting a detailed analysis to measure patient outcomes from the two different ALS service levels (i.e., deployment of EMT-Is and EMT-Ps interchangeably) to ensure the department's desired level of service is provided
- Measuring performance as a means of achieving stated service level goals
- Updating policies and procedures for origin and cause investigations that are commensurate with accepted fire investigation standards
- Conducting training on how to properly value and record fire loss data, and developing a mechanism of quality assurance for the valuation and recording of this data

MCFRS HEADLINE PERFORMANCE MEASURE #6

Percent of Montgomery County Residents Surveyed Who Rate MCFRS' Injury and Fire Prevention Education Services Effective

- **SUPPORTING MEASURE #5.1**

Number of fire incidents where smoke detectors were not operational or not present

1 – CONTRIBUTION TO MONTGOMERY RESULTS

- **Safe Streets and Secure Neighborhoods**

2 – PERFORMANCE

[Not available. Measure remains under development.]

3 – STORY BEHIND THE PERFORMANCE

Fire safety in Montgomery County is dependent upon the fire safety knowledge, awareness, and responsibility of its residents. The fire and rescue service should strive and encourage within its means to improve this knowledge, awareness and responsibility. In general, the greatest fire risk is to residents in their homes; therefore these occupancies and their residents must be the highest targetted focus. Many factors contribute to improve or restrict the ability of MCFRS to increase the knowledge and awareness of residents. These factors are presented below.

RESTRICTING FACTORS

a. **Insufficient staff to deliver and coordinate comprehensive programs:** MCFRS lacks adequate staff dedicated to fire safety education and outreach. One nationally recognized fire protection analysis and consulting firm (i.e., Tri Data) recommends a minimum of one fire and life safety educator per 100,000 residents. Considering this benchmark, MCFRS – with two positions attributed to fire and life safety education – would be considered at 20% strength. Countries who have achieved improved fire

and life safety records that resulted in lower numbers of deaths and dollar loss accomplished this after having committed up to 10% (approximately 100 staff) of their total firefighting force to dedicated fire and life safety functions.

b. **Insufficient funding for materials and resources:** Considering the number of residents that need to be reached through our door-to-door, event-based, and service partner programs, MCFRS falls short of materials and other resources. Past focused programs required the department to seek donations of materials to be able to meet demand. Donations have declined in the recent economic downturn.

c. **Demographic Influences – Seniors:** Montgomery County experienced an increase in the number of fire deaths to senior citizens between 2003 and 2008 with fourteen of fifteen overall deaths during those years attributed to residents over 65 years. Several seniors have died in fires since 2008 as well. Aggressive attention to the risk has reduced the number of deaths to less than one death per 100,000 population. There is evidence that outreach education works to reduce risk, but it must be focused and sustained. The trend and projection for significant increases in residents age 65 and older offers the potential for increased risk to continue. People over the age of 65 experience a fire death rate nearly twice the national average for all ages; over 75 years of age the fire death rate jumps to three times the national average for all ages.

d. Demographic Influences – Language Proficiency: Montgomery County is a diverse community, and growth of residents with limited English proficiency can have an effect on the ability for the County to provide critical safety information to the entire population. Focused programs that cater to at-risk populations, using a more functional all–purpose outreach approach involving people having language ability that matches the community, may have an effective impact.

e. Demographic Influences – Crowding: Migration to the Washington Metropolitan Region by people from other parts of the world has put a strain on available affordable housing. An increasing number of new residents resort to living in homes that were originally intended to house one family. As in item "d" above, these are also people with little or no English proficiency and may not be aware of acceptable safe practices for homes. Montgomery County experienced a multi-fatality fire five years ago that was the result of more then one family living in the home. It was set up with a second kitchen that was not properly installed or inspected, resulting in the deaths of the entire family. At least one near-miss fire in crowded homes occurs every year within the County, and it is a concern that MCFRS will continue to be aware of and try to prevent it.

f. **Opportunities to provide safety education in schools is limited**: A program to provide safety education in school – "Risk Watch" – has not met our full expectations. It has been under-utilized by the schools, as it has not been a required curriculum and local principals and teachers have the option to participate in the program or not. MCFRS feels this is one very important area of education to provide

in the early education environment because it forms a good early base of knowledge. Schools are under pressure to achieve higher scores in academic testing and are concerned if they are not putting all effort and resources into this priority. This situation negatively impacts their willingness to include Risk Watch in their curriculums.

g. **Complacency to the risk of fire**: People in general are complacent to the risk of fire. Most believe that fires happen to other people, not themselves.

h. **Lack of awareness of home fire risk:** Residents, for the most part, are not aware of the risk of fire in their homes. When combined with the concerns identified above in items "c-e," homes continue to be the highest fire risk occupancy in the country, State and in Montgomery County. Most residents are not aware of the ferocious speed that fire can develop and limit their safe escape. They are unaware of actions they can take to reduce risk and improve survival if fires or other dangerous conditions occur in their homes.

i. **Certain groups of people are more inclined to experience a fire:** Evidence indicates that some people are more inclined to experience fires then others. There are a disproportionate number of fires in the United States resulting in deaths, injuries, and monetary loss to seniors, the poor, African Americans, and Native Americans.

j. **English proficiency and literacy:** People need to be able to read and understand information that is presented to them in the many available materials and media.

k. **Residents are not open to home visits by firefighters:** MCFRS finds that on our door-to-door safety program, personnel are only admitted to a small percentage of homes and not usually more than three out of ten. Many residents do not answer the door and those who do are often reluctant to participate in allowing their smoke alarm to be checked. This type of program has been shown throughout the world to be a key program in increasing operable smoke alarms and offering advice and training on home hazards and fire escape planning for residents.

CONTRIBUTING FACTORS

a. Residential sprinkler requirements: All new homes constructed in Montgomery County since January 1, 2004 have been required to have residential fire sprinkler systems. They are a resident's best defense against a serious fire because sprinklers confine fires, save lives, and reduce property damage. Residential sprinklers are designed to operate in the early stages of a fire; thus reducing the chance that a room will flash over.

b. Smoke alarms: Smoke alarms have been required by County law since 1978. Later versions of codes have enhanced the way smoke alarms work by requiring they

interact with each other, be hard wired, have a battery back up, and be located on each level of the home and in every room used for sleeping.

c. **Risk Watch:** Montgomery County participates in the NFPA "Risk Watch" program that serves as a school and child activity-based all-hazards curriculum. Unfortunately in Montgomery County, less then half of the elementary schools participate in the program due to pressure to achieve higher test scores. Future marketing of the program should seek the potential to let the curriculum be interwoven into normal lessons, so that both academic and safety criteria can be met.

d. **Safety in Our Neighborhood:** During FY09**,** MCFRS re-established the innovative "Safety in Our Neighborhood" (SION) program involving direct interface with County residents. The program has an all-hazards approach that includes a method for eliminating injuries of all types in the home. The SION program took firefighters to homes following extensive local advertising to ensure people were aware they would be coming. Firefighters have found an unacceptable number of missing, non-working, and/or obsolete smoke alarms and have assisted residents in improving their home environment to reduce injuries, deaths, and property loss.

WHAT WE PROPOSE TO DO TO IMPROVE PERFORMANCE

To move toward meeting the departmental goal of achieving survey results where residents rate the department's education efforts as effective, MCFRS will increase the fire safety knowledge and awareness of County residents to a defined, acceptable level appropriate to risks for the targeted residents by:

- Using the existing Safety in Our Neighborhood program of door-to-door visits
- Increasing marketing for the door-to-door visits to include news stories, social networking, and more scheduled and focused neighborhood visits
- Using the MCFRS web sites and public service announcements to make information available
- Training and working directly with social care-givers who regularly interface with people of high risk and supporting them with materials and technical support
- Using volunteers (e.g., MCFRS Mobile Volunteer Corps, Community Emergency Response Teams) to deliver educational and outreach programs
- Focusing efforts at educating family and community care-givers for those at risk
- Employing benchmark efforts proven successful in Europe and Pacific Rim nations to increase knowledge and awareness of community, home, and personal risk